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EXAMINER

PATTON, PAUL E

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2822

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06/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/522,887	Applicant(s) KUSUSE ET AL.	
	Examiner Paul E. Patton	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>20070503</u> . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/22/2005 & 10/16/2006</u> . | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 16 –26, 28, and 29-54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. As to claims 16, 17, and 19-26, these claims are directed to claim 1 but lack antecedent basis and hence the extent of the claims cannot be accurately interpreted. The examiner believes that these claims should depend on either claim 14 or 15 based on the context.

5. Claim 18 is dependent on claim 4 but lacks antecedent basis and according to the context appears to depend on claim 17.

6. Claim 28 is directed to claim 14 but lacks antecedent basis and instead appears to modify independent claim 27.

7. Independent claims 29, 45 and 46 are incomprehensible as written and hence cannot be reliably interpreted. The statement contained in these claims that the periphery is defined by a first side surfaces, each having a width increasing from the lower surface side toward the upper surface side, and second side surfaces, each

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having a width increasing from the upper surface side toward the lower surface side, appear to conflict with one another and the confusion cannot be resolved by reference to the specification.

8. Claims 47 – 50 refer to independent claim 45 and refer to a light-transforming member, which is not recited in independent claim 45. Hence, these claims lack antecedent basis.

9. The examiner will endeavor to treat the claims according to his best understanding and interpretation of the intent of the application.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 14 -16, 20, 21, and 23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Thiebeault et al., (USPAT 6,410,942 B1) Thiebeault.

12. Thiebeault discloses and shows (Fig 3) a nitride semiconductor light-emitting device comprising: an n-type nitride semiconductor layer; p-type nitride semiconductor layer; and a luminescent layer (32) formed of a nitride semiconductor between the n-type nitride semiconductor layer and the p-type nitride semiconductor layer (40), wherein at least the p-type nitride semiconductor layer and the luminescent layer defining a frustum layered composite, and the layer composite is embedded in a metal

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member (42) so that the periphery of the layered composite is isolated and is supported by a metal member (42) opposing the surface of the layered composite. (Column 6, line 56 – Column 7, line 25).

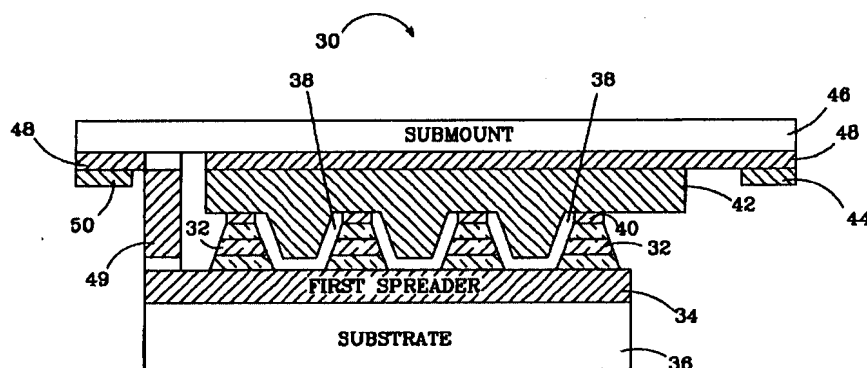


FIG. 3

13. Claims 16 – 26 are interpreted by the examiner as depending on independent claim 14 for the purposes of this office action.

14. As to claim 16, Thiebeault discloses and shows (Fig 3) that the surface of the metal member (42) opposite to the surface opposing to the layered composite is flat.

15. As to claim 20, Thiebeault discloses that the layered composite (32) includes part of the n-type nitride semiconductor layer. (Column 6, lines 33-34).

16. As to claim 21, Thiebeault discloses that the layered composite includes the entire n-type nitride semiconductor layer. (Column 6, lines 33-34).

17. As to claim 23, Thiebeault discloses and shows (Fig 3) that the device has a plurality of the layered composite (32).

18. As to claim 24, this claim appears to depend on claim 21. Thiebeault discloses and shows (Fig 3) the n-type nitride semiconductor layer (34) is common to the plurality

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of the layered composites and the layered composites are disposed on the common n-type nitride semiconductor layer.

19. As to claim 25, Thiebeault discloses that the layered composites have the respective n-type nitride semiconductor layers. (Column 5 lines 10-20).

20. As to claim 26, Thiebeault discloses that the metal member comprises a metal or an alloy containing the metal, the metal being selected from the group including Ti, Ag, Al, Ni, Pt, Au, Rh, Cu, and W. (Column 7, lines 21-23).

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 1, 2, 4 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krames et al., (USPAT 6,229,160 B1) Krames in view of Kato et al., (US2002.0017651 A1) Kato.

23. As to claim 1, Krames discloses and shows (Fig 2) a semiconductor light-emitting device comprising: a substrate (15); a layer portion emitting light (10) disposed on the substrate, the layer portion including an n-type semiconductor layer (20), an active layer (11), and a p-type semiconductor layer (21) ; and an n electrode (14), wherein the layer portion has an included periphery at which the surface of the n-type semiconductor

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layer is exposed, and the n electrode is disposed on the surface of the n-type semiconductor layer.

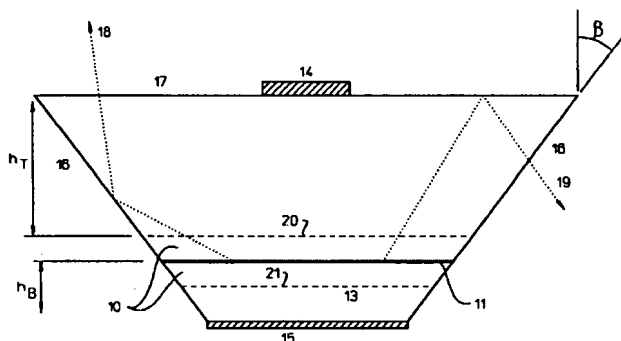


Figure 2

24. Krames does not disclose that the semiconductor device is a nitride type device.

25. Kato is related to a similar semiconductor light-emitting device. Kato discloses that the device is a nitride type device. (Paragraph [0032]).

26. Kato is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a nitride type semiconductor light-emitting device.

27. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Krames by using a nitride type semiconductor light-emitting device for advantages such as producing a white light emitting diode according to the teachings of Kato. (Paragraph [0014]).

28. As to claim 2, Krames discloses and shows (Fig 11) that the n electrode surrounds the layered portion.

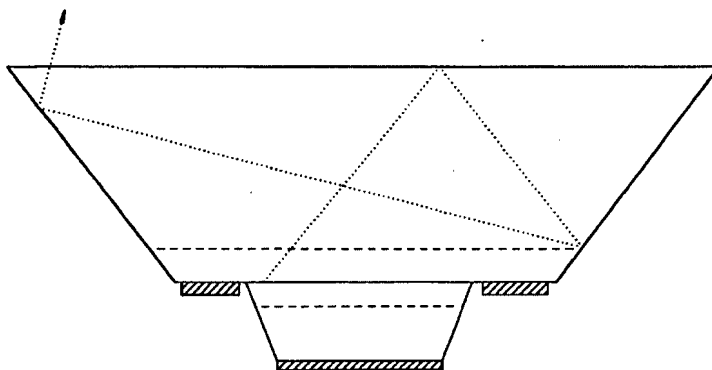


Figure 11

29. As to claim 4, Krames discloses and shows (Fig 6) that the layered portion has a circular shape.

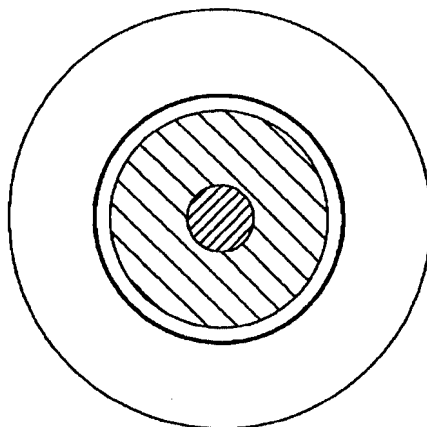


Figure 6

30. As to claim 9, Krames discloses and shows (Fig 10) a reflection layer covering the layered portion

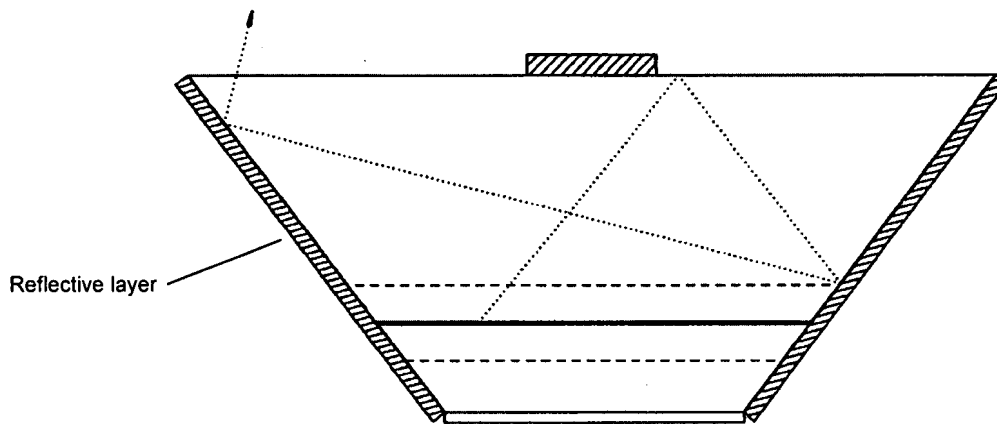


Figure 10

31. As to claim 10, Krames discloses that the reflection layer is of a metal layer covering the layer portion with an insulating layer therebetween. (Column 8, lines 51-55).

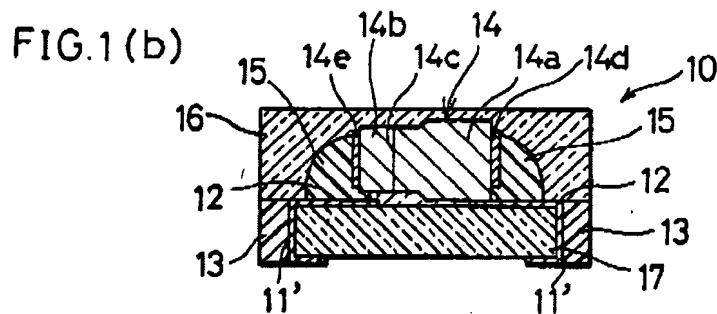
32. As to claim 11, Krames discloses that the metal layer serves as a connecting electrode for connecting the p ohmic electrodes of the p-type semiconductor layer of the layered portions. (Column 8. lines 60-65).

33. As to claim 12, Krames discloses that the reflection layer comprises a dielectric multilayer film. (Column 8, lines 60-65).

34. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krames in view of Kato and further in view of Okazaki (USPAT 5,814,837) Okazaki.

35. Krames as modified by Kato does not disclose that the n electrode continuously extend to the lower surface of the substrate through the side surfaces of the substrate.

36. Okazaki shows (Fig 1b) the n electrode (11) continuously extends to the lower surface of the substrate (17) through the side surface of the substrate.



37. Okazaki is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to form the n electrode to continuously extend to the lower surface of the substrate through the side surfaces of the substrate.

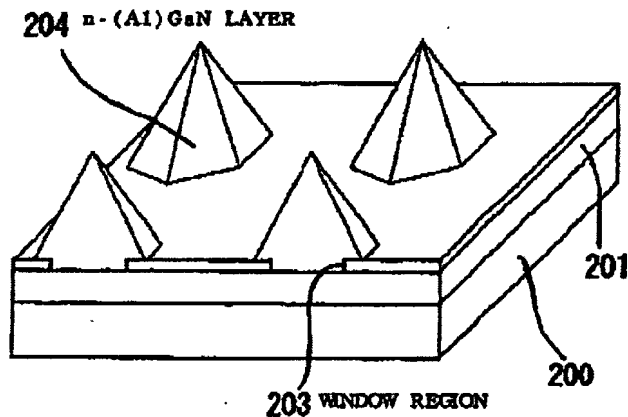
38. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Krames as modified by Kato by forming the n electrode to continuously extend to the lower surface of the substrate through the side surfaces of the substrate for advantages such as providing high tolerance to external stress and ability to be mass produced according to the teachings of Okazaki. (Column 3, lines 24-26).

39. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krames in view of Kato and further in view of Okuyama et al. (US 2002/0117677 A1) Okuyama.

40. As to claim 5, Krames as modified by Kato does not disclose that the layered portion has a hexagonal shape.

41. Okayama discloses and shows (Fig 65) that the layered portion has a hexagonal shape. (Paragraph [0284]).

FIG. 65



42. Okuyama is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to form the layered portion in a hexagonal shape.

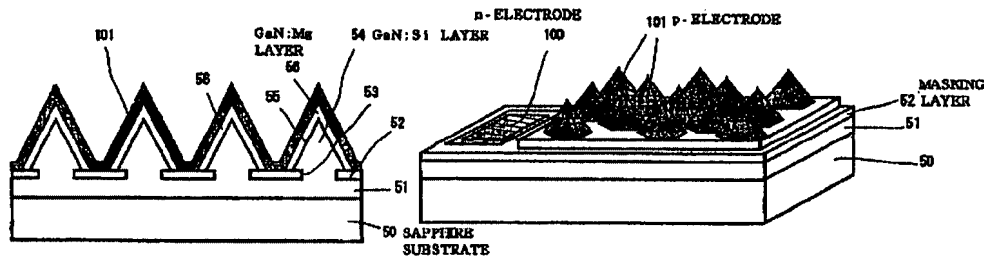
43. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Krames as modified by Kato by forming the layered portion in a hexagonal shape for advantages such as enhanced brightness according to the teachings of Okuyama. (Paragraph [0021]).

44. As to claim 6, Okuyama further teaches (Fig 65) that the device has a plurality of layered portions (204) emitting light.

45. As to claim 7, Okuyama further teaches (Fig 53) that the respective n electrodes (53) for the layered portions (56) are connected to each other to define a common electrode. (Paragraph [0341]).

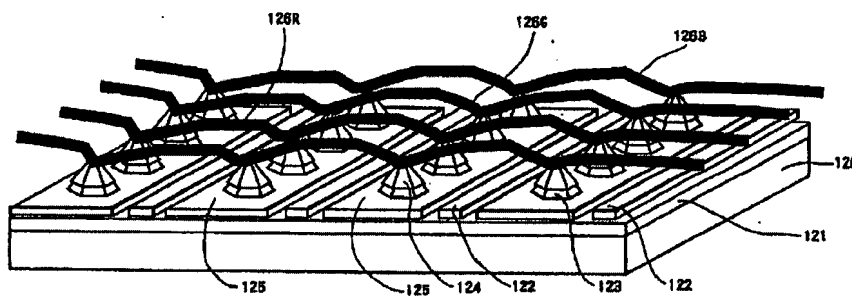
FIG. 53A

FIG. 53B



46. As to claim 8, Okuyama further teaches and shows (Fig 54) that the layered portions have respective p ohmic electrodes (101) in ohmic contact with the respective p-type semiconductor layers, and the p ohmic electrodes are connected (126) to each other.

FIG. 54



47. Claims 13 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krames in view of Kato and further in view of Thiebeault et al., (USPAT 6,410,942 B1) Thiebeault.

48. Krames as modified by Kato does not disclose that the inclined periphery has a convex surface protuberating outward.

49. Thiebeault is related to a similar array of light-emitting devices. Thiebeault discloses and shows (Fig 13) that the inclined periphery (142) has a convex surface protuberating outward.

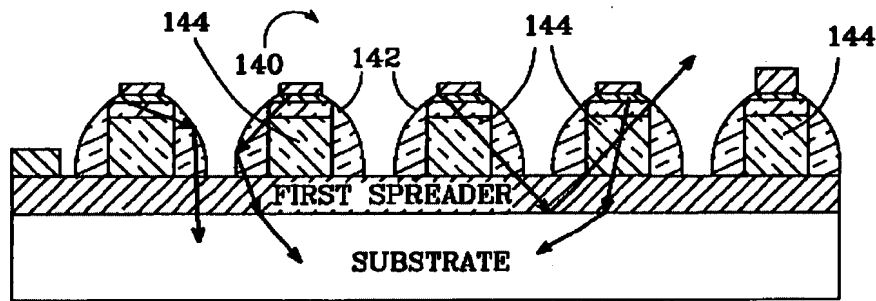


FIG. 13

50. Thiebeault is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to form the inclined periphery having a convex surface protuberating outward.

51. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Krames as modified by Kato by forming the inclined periphery having a convex surface protuberating outward for advantages such as improved light extraction according to the teachings of Thiebeault. (Column 3, lines 45-48).

52. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thiebeault in view of Nuyen (USPAT 5,593,917) and further in view of Okazaki

53. Thiebeault discloses and shows (Fig 3) a method for manufacturing comprising: the first step of forming an n-type semiconductor layer, a luminescent layer, and a p-type semiconductor layer on a substrate; and the second step of forming a frustum

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luminescent regions including the p-type semiconductor layer and the luminescent layer. (Column 6, line 56 – Column 7, line 25).

54. Thiebeault does not explicitly disclose the third step of forming a metal member so as to cover the luminescent layer; the fourth step of removing the substrate; and the fifth step of cutting the metal member between the luminescent regions to separate light-emitting devices from one another.

55. Nuyen discloses and shows (Fig 15) the third step of forming a metal member (8) so as to cover the luminescent layer (6); and the fourth step of removing the substrate (1).

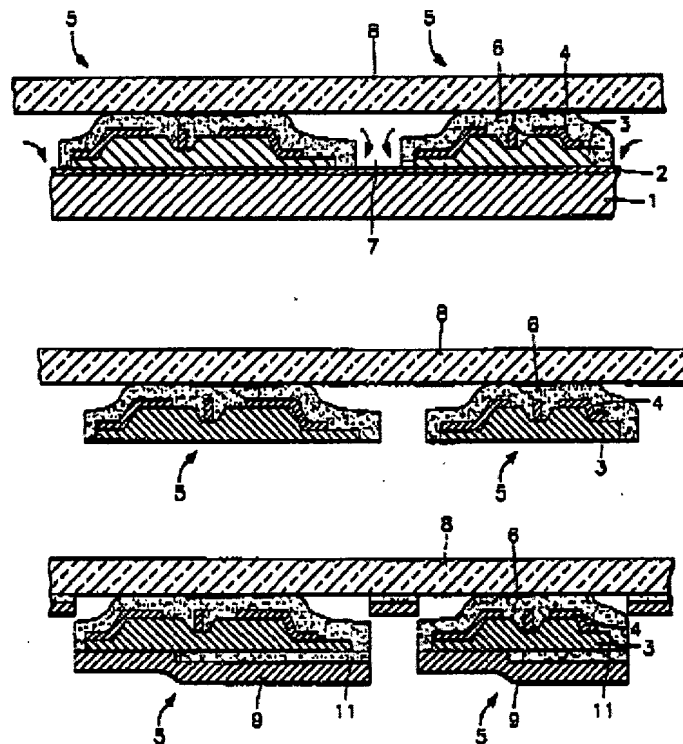
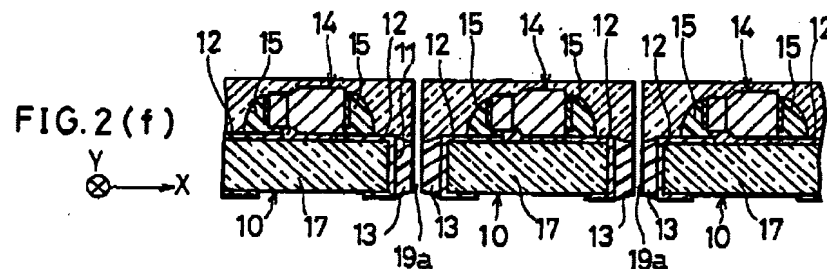


Fig 15

56. Nuyen is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to perform the third step of forming a metal member so as to cover the luminescent layer; the fourth step of removing the substrate

57. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Thiebeault to perform the third step of forming a metal member so as to cover the luminescent layer; the fourth step of removing the substrate for advantages such as reducing the thickness of components according to the teachings of Nuyen. (Column 1, lines 54-58).

58. Further, Okazaki discloses and shows (Fig 2f) the fifth step of cutting the metal member between the luminescent regions to separate (19) light-emitting devices from one another.



59. Okazaki is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to perform the fifth step of cutting the metal member between the luminescent regions to separate light-emitting devices from one another.

60. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Thiebeault as modified by Nuyen to perform the fifth step of cutting the metal member between the luminescent regions to separate

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light-emitting devices from one another for advantages such as providing high tolerance to external stress and ability to be mass produced according to the teachings of Okazaki. (Column 3, lines 24-26).

61. As to claim 28, Okazaki further teaches that the metal member is formed by plating. (Okazaki, Column 6, line 64).

62. Claims 17, 18 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thiebeault in view of Krames.

63. As to claim 17, Thiebeault discloses (Thiebeault, Fig 3) that the layer opposite the n-type layer has the layered composite but does not disclose a transparent electrode on one of two opposing surfaces of the n-type nitride semiconductor layer.

64. Krames discloses that one of the layer surfaces can have a transparent electrode. (Krames, Column 6, lines 20-25).

65. Krames is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to apply a transparent electrode to one of the n-type layer surfaces.

66. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Thiebeault by applying a transparent electrode to one of the n-type layer surfaces for advantages such as improved light extraction in a light-emitting device according to the teachings of Krames. (Krames, Column 6, lines 18-20).

67. As to claim 18, Krames further teaches that the electrode comprises ITO. (Column 6, line 22).

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68. As to claim 22, Thiebeault discloses the claimed invention except for the thickness of the metal member being 50um or more. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to form the metal member with a thickness of 50um or more, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

69. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thiebeault in view of Steigerwald et al., (US 2003/0230754 A1) Steigerwald.

70. Thiebeault discloses and shows (Thiebeault, Fig 3) the p electrode (40) being disposed between the layered composite and the metal member (42) to establish an ohmic contact with the p-type nitride layer.

71. Thiebeault does not disclose that the electrode is Rhodium.

72. Steigerwald discloses that the p electrode can be Rhodium. (Paragraph [0028]).

73. Steigerwald is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use Rhodium as the p electrode.

74. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Thiebeault by using Rhodium as the p electrode for advantages such as low optical absorption according to the teachings of Steigerwald. (Paragraph [0028]).

75. Claims 29-33, 35 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krames.

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76. As to claim 29, Krames discloses and shows (Fig 2) a light-emitting device comprising a structure including a first conductivity type layer (21); as second conductivity type layer (20); and a luminescent layer (11) between the first and second conductivity type layers, wherein at least part of the structure defines a structure portion having a lower surface with a width in sectional view, an upper surface with a smaller width than the width of the lower surface in section view, and an inclined periphery.

Note that Krames' figures are inverted with respect to applicant's figures.

77. As to the rest of claim 29, the wording is unclear and is thus disregarded by the examiner.

78. As to claim 30, Krames discloses and shows (Fig 3 and 5) the first side surfaces are formed in the corner defined by the sides of the lower surface.

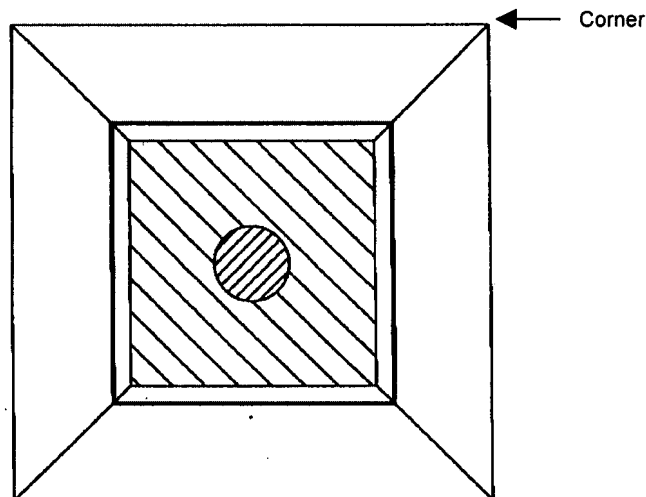


Figure 5

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79. As to claim 31, Krames discloses and shows (Fig 2) the luminescent layer (11) is disposed inside the structured portion.

80. As to claim 32, Krames discloses and shows (Fig 5) that the lower surface has a square or polygonal shape, the second side surfaces are formed on the sides of the lower surface, and the first side surfaces are formed in the corners of the lower surface.

81. As to claim 33, Krames discloses (Fig 3) that the structured portion is of frustum.

82. As to claim 35, Krames discloses the claimed invention except for the first side surfaces define rounded sides of the lower surface and the upper surface and the curvature radius of the rounded sides of the upper surface is larger than that of the lower surface whereas Krames discloses the inverse. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to reverse the radius of curvature of the upper and lower surfaces to produce smooth sidewalls according to the teachings of Krames (Column 6, lines 28-31), since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

83. As to claim 41, Krames discloses and shows (Krames, Fig 3) a pair of electrodes (14, 15) disposed separately on the upper surface side of the structured portion and on the lower surface side, wherein the pair of the electrodes are respectively disposed on the surface of the first conductivity type layer and the surface of the second conductivity type layer.

84. Claims 36, 39 and 42 – 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krames in view of Thiebeault.

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85. As to claims 36 and 39, Krames does not disclose a plurality of structured portions, and the electrode structure is provided so that the structured portions substantially simultaneously emit light.

86. Thiebeault discloses and shows (Thiebeault, Fig 1) a plurality of structured portions, and the electrode structure is provided so that the structured portions substantially simultaneously emit light.

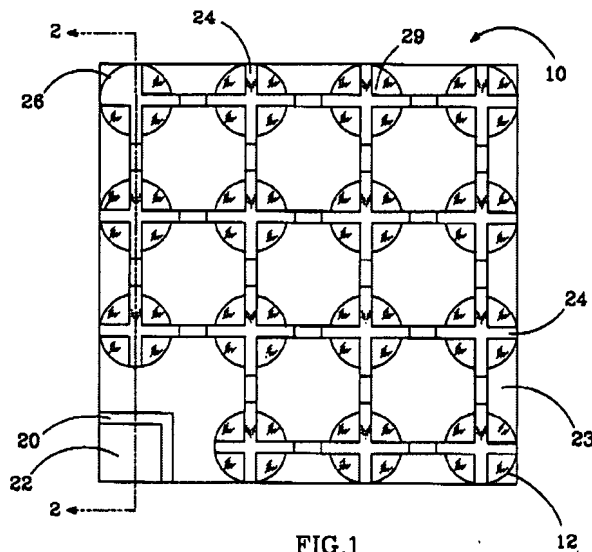


FIG.1

87. As to claim 42, Krames does not explicitly disclose a light-transmissive insulating layer covering the periphery of the structured portion; and a filling member around the periphery with the light-transmissive insulating layer therebetween.

88. Thiebeault discloses and shows (Fig 15) a light-transmissive insulating layer (162) covering the periphery of the structured portion (164); and a filling member around the periphery with the light-transmissive insulating layer therebetween.

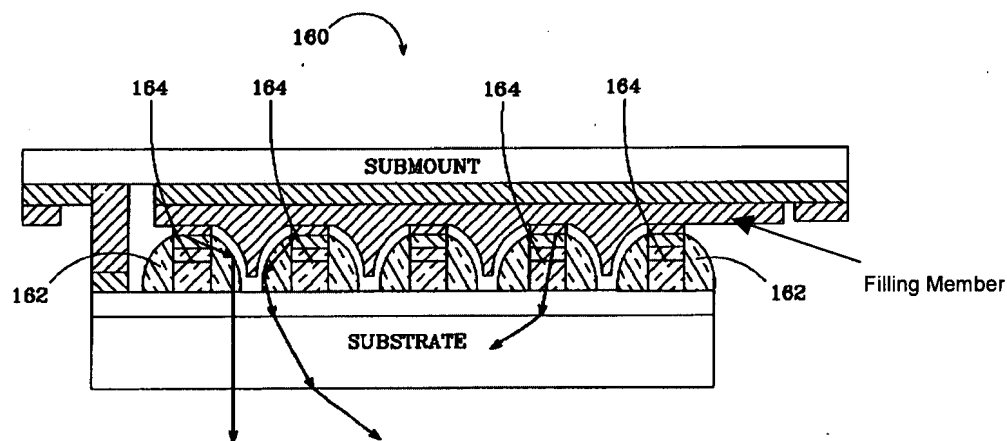


FIG.15

89. As to claim 43, Thiebeault further shows (Fig 15) a plurality of the structured portion, and the structured portions are separated from one another by a protruding filling member.

90. As to claim 44, Thiebeault further shows (Fig 15) the luminescent layer is disposed inside the structured portion, and the filling member protrudes below the luminescent layer toward the lower surface side of the structured portion.

91. Claims 37, 38 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krames in view of Thiebeault and further in view of Steigerwald.

92. As to claim 37, Krames does not disclose a pair of positive and negative electrodes on the same surface side over the upper surface of the structured portion.

93. Steigerwald discloses and shows (Steigerwald, Fig 1) a pair of positive and negative electrodes (41) on the same surface side over the upper surface of the structured portion.

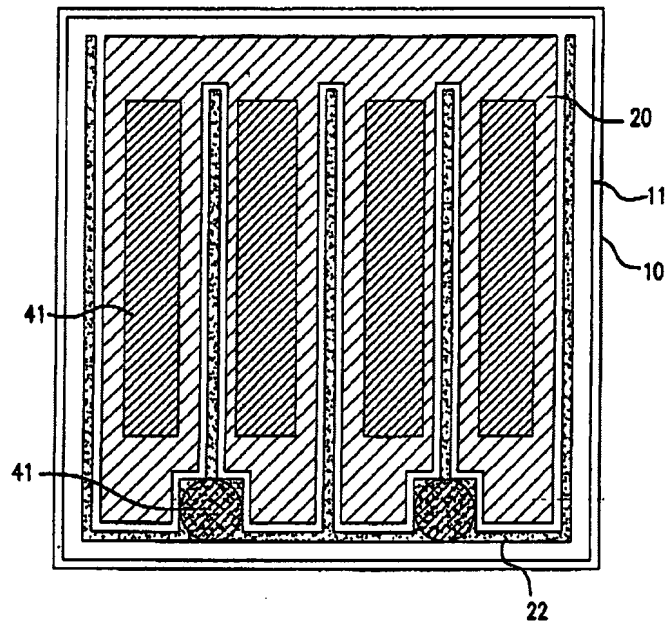


FIG. 1

94. As to claim 38, Steigerwald further shows that on of the pair of the electrodes covers part of the periphery of the structured portion.

95. As to claim 40, Krames does not disclose the upper surface of the structured portion defines a mounting surface which opposes a mounting base when the light-emitting device is disposed on the mounting base, and wherein one of the pair of the electrodes is disposed on a substrate, and the other comprises a wiring structure disposed on the mounting base side so as to be connected to the upper surfaces of the separately disposed plurality of the structured portions.

96. Thiebeault discloses (Thiebeault, Fig 3 and 1) discloses the upper surface of the structured portion defines a mounting surface (42) which opposes a mounting base when the light-emitting device is disposed on the mounting base (36), and wherein one of the pair of the electrodes is disposed on a substrate, and the other comprises a

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wiring structure (24) disposed on the mounting base side so as to be connected to the upper surfaces of the separately disposed plurality of the structured portions.

97. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thiebeault.

98. Thiebeault discloses and shows (Fig 3) a structure having a first conductivity type layer; a second conductivity type layer; and a luminescent layer(32) between the first and second conductivity type layers, wherein at least part of the structure defines a structured portion (38) having a lower surface with a width in sectional view, and upper surface with a small width than the width of the lower surface in section view, and a inclined periphery, and a mounting portion (46) on which the light-emitting device is placed, wherein the light emitting device in mounted on a support (42) and then placed on the mounting portion.

99. As to the remainder of claim 45 and the similar portion of claim 46, as noted above, the statements are unclear and therefore have been disregarded by the examiner.

100. Claims 46 – 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thiebeault in view of Sano et al. (US 2003/0141506) Sano.

101. As to claim 46, Thiebeault discloses and shows (Fig 3) a structure having a first conductivity type layer; a second conductivity type layer; and a luminescent layer(32) between the first and second conductivity type layers, wherein at least part of the structure defines a structured portion (38) having a lower surface with a width in sectional view, and upper surface with a small width than the width of the lower surface

in section view, and a inclined periphery. Thiebeault does not disclose a light-transforming member for transforming part of light emitted from the light-emitting device in light having a different wavelength.

102. Sano discloses a light-transforming member for transforming part of light emitted from the light-emitting device in light having a different wavelength. (Paragraph [0038]).

103. Sano is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a light-transforming member for transforming part of light emitted from the light-emitting device in light having a different wavelength.

104. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Thiebeault by using a light-transforming member for transforming part of light emitted from the light-emitting device in light having a different wavelength for advantages such as producing white light with high color rendering according to the teachings of Sano. (Paragraph [0038]).

105. Claims 47 through 50 reference the light transforming member and hence, logically depend on claim 46 and not 45. Also, claims 51 through 54 are duplicates of claims 46 through 50. Disposition of claims 46 through 50 equally apply to the duplicates.

106. As to claim 47, Sano discloses a light-transforming member comprising an aluminum garnet phosphor containing Al; at least one element selected from the group consisting of Y, Lu, Sc, La, Gd, Tb, Eu, and Sm; one of Ga and In at least one element selected from the rare earth elements. (Paragraph [0038]).

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107. As to claim 48, Sano also discloses a phosphor expressed by $(\text{Re}_{1-x}\text{R}_x)_3(\text{Al}_{1-y}\text{Ga}_y)_5\text{O}_{12}$ ($0 < x < 1$) and $0 \leq y \leq 1$ wherein Re represents at least one element selected from the group consisting of Y, Gd, La, Ly, Tb and Sm; and R represents Ce or Ce and Pr). (Paragraph [0038]).

108. As to claim 49, Sano further discloses a nitride phosphor containing N; at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Zn; and at least one element selected from the group consisting of C, Se, Ge, Sn, Ti, Zr, and Hf, and is activated by at least one element selected from the rare earth elements. (Paragraph [0052]).

109. As to claim 50, Sano further teaches the nitride phosphor is expressed by the general formula $\text{L}_x\text{Si}_y\text{N}_{(2/3x + 4/3y)}:\text{Eu}$ or $\text{L}_x\text{Si}_y\text{O}_z\text{N}_{(2/3x + 4/3z)}:\text{Eu}$ (L represents Sr, Ca, or Sr and Ca). (Paragraph [0052]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E. Patton whose telephone number is 571-272-9762. The examiner can normally be reached on 7:00 - 5:30 Monday through Thursday.

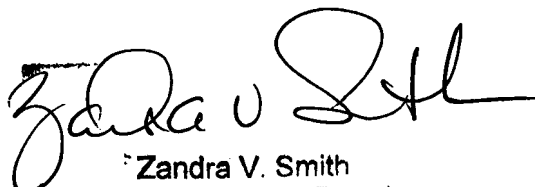
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Paul E Patton
Examiner
Art Unit 2822


PEP


Zandra V. Smith
Supervisory Patent Examiner
22 May 2007